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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/666,619	09/17/2003	Jin Yang	42P8534C	6808

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EXAMINER

PARIHAR, SUCHIN

ART UNIT	PAPER NUMBER
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2825

DATE MAILED: 12/01/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

10/666,619

Applicant(s)

YANG, JIN

Examiner

Suchin Parihar

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 9/11/2006.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-19 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-19 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
 - ☐ Certified copies of the priority documents have been received in Application No. _____.
 - ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftperson's Patent Drawing Review (PTO-948) | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08)
Paper No(s)/Mail Date <u>9/11/06</u> . | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

This FINAL office action is in response to application 10/666,619, amendment filed 9/11/2006. Claims 1, 11, 16 and 19 have been currently amended.

Applicant's arguments filed 9/11/2006 have been fully considered but they are not persuasive. The applicable rejections from the previous office action have been incorporated herein.

Claim Rejections - 35 USC § 112

1. The following is a quotation of the first paragraph of 35 U.S.C. 112:

The specification shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the same and shall set forth the best mode contemplated by the inventor of carrying out his invention.

2. **Claims 6-10 are rejected under 35 U.S.C. 112, second paragraph**, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention. With respect to claim 6, the phrase "implication structure" is not clearly described in the specification and not clearly defined in claim 6. Claims 7, 8, 9 and 10 depend from claim 6.

3. The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

4. **Claims 12-15 are rejected under 35 U.S.C. 112, second paragraph**, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention. With respect to claim 12, the limitation "structure of

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the first property", found on the last line of claim 12, is neither clearly described in the disclosure nor clearly defined in claim 12. Claims 13-15 depend from claim 12.

5. **Claims 17-19 are rejected under 35 U.S.C. 112, second paragraph**, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention. With respect to claim 17, the specification fails to support "logical structure of the first property", found on the last line of claim 17. Claims 18 and 19 depend from claim 17.

Claim Rejections - 35 USC § 102

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

6. **Claims 1-5, 11 and 16 are rejected under 35 U.S.C. 102(b)** as being unpatentable over the Chiodo et al. (Chiodo) paper "Automatic Compositional Minimization in CTL Model Checking" (Nov, 1992), pages 172-178.

7. With respect to claim 1, Chiodo teaches: generate, from a first property, a first assumption including a first state predicate (pg 172, 1 Introduction, 1st paragraph, i.e. to deduce properties by reasoning of the individual components and their interactions without ever building the composed system [assumption]); generate, for a model, a first transition relation that includes the first state predicate (pg 173, 2.1 FSM Model, i.e. transition from present state to next state enabled by input i); and reduce the first

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transition relation according to the first assumption (pg 175, 3.2 Model Checking on a System of FSMs, i.e. reduced transition relation).

8. With respect to claim 2, Chiodo teaches all the elements of claim 1, from which the claim depends. Chiodo teaches: wherein reducing the first transition relation reduces the size of the model (pg 172, Introduction 1, i.e. one tries to reduce the components in such a way that their composition yields a smaller model).

9. With respect to claim 3, Chiodo teaches all the elements of claim 1, from which the claim depends. Chiodo teaches: wherein reducing the first transition relation reduces the computational complexity of evaluating the first property (pg 173, Introduction, paragraphs 6 & 7, i.e. discussion of only preserving the behavior to verify the property, and reducing the size of the representation by removing irrelevant behavior).

10. With respect to claim 4, Chiodo teaches all the elements of claim 1, from which the claim depends. Chiodo teaches: wherein reducing the first transition relation reduces the number of variables in the model (pg 172, Introduction, paragraph 4, i.e. to produce component machines that have fewer states than the original ones).

11. With respect to claim 5, Chiodo teaches all the elements of claim 1, from which the claim depends. Chiodo teaches: wherein reducing the first transition relation reduces the number of variables in the first transition relation (pg 172, Introduction, paragraph 4, i.e. to produce component machines that have fewer states than the original ones).

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12. With respect to claim 11, Chiodo teaches: means for producing, from a first property, a first assumption including a first state predicate (pg 172, Introduction 1, 1st paragraph, i.e. to deduce properties by reasoning of the individual components and their interactions [assumption]); and means for producing a reduced next state function from a first next state function involving the first state predicate by applying the first assumption (pg 173, FSM Model 2.1, i.e. input to each component consists of present states [state predicate] and external inputs [assumption], and in this way, interacting FSM models [functions] produce a reduced transition relation).

13. With respect to claim 16, Chiodo teaches: a recordable medium to store executable instructions; a processing device to execute executable instructions (i.e. the term 'automatic' [see title] implies the use of a computer to produce the result(s) of the invention); and a plurality of executable instructions to cause the processing device to: produce, from a first property, a first assumption including a first state predicate (pg 172, Introduction 1, 1st paragraph, i.e. to deduce properties by reasoning of the individual components and their interactions [assumption]); produce, for a model, a first transition relation that includes the first state predicate (pg 173, 2.1 FSM Model, i.e. transition from present state to next state enabled by input i); and reduce the first transition relation according to the first assumption (pg 175, 3.2 Model Checking on a System of FSMs, i.e. reduced transition relation).

Response to Arguments

14. Applicant's arguments filed 9/11/2006 have been fully considered but they are not persuasive.

35 U.S.C. 112 2nd paragraph Rejections

15. Applicant asserts that one of ordinary skill in the art, after reading the specification (in particular Figures 5a-5c, 6a-6d and 7a-7b), would find the term "implication structure" to be clear and definite with respect to the claim's scope, in light of the specification. Examiner disagrees with this assertion.

16. Examiner agrees that the term "implication operation" is clearly pointed out and described in the specification. However, the term "implication structure" suggests something tangible or physical (i.e. structure), and is not clearly described in the specification and in the claims. If it is the case that "implication structure" is somehow a result of the "implication operation", the specification needs to be amended in order to support such a result, in order to overcome the 35 U.S.C. 112 rejection set forth in this office action for claims 6-10; or the term "implication structure" needs to be defined in the claims.

15. Applicant asserts that one of ordinary skill in the art, after reading the specification (in particular Figures 5a-5c, 6a-6d and 7a-7b), would find the term "structure of the first property" to be clear and definite with respect to the claim's scope, in light of the specification. Examiner disagrees with this assertion.

16. Examiner points out that "structure of the first property" is not clearly defined or described in the specification. The specification, in paragraph [0076], describes data structures, which may include circuit descriptions, transition relations, and finite state models. The specification also describes, in paragraph [0055], at a first stage the property is parsed into a root representing the logical implication operation, a left sub-

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property representing the variable, and a right sub-property representing $b \Rightarrow X(Xf)$.

However, neither of these paragraphs describe how the "first property" has any kind of tangible or physical "structure". One of ordinary skill in the art, after reading the specification, would not understand the scope of "structure of the first property" with a sufficient degree of particularity and clarity.

17. Applicant asserts that one of ordinary skill in the art, after reading the specification (in particular Figures 5a-5c, 6a-6d and 7a-7b), would find the term "logical structure of the first property" to be clear and definite with respect to the claim's scope, in light of the specification. Examiner disagrees with this assertion.

18. Examiner points out that "logical structure of the first property" is not defined or described in the specification. The specification, in paragraph [0076], describes data "structures", which may include circuit descriptions, transition relations, and finite state models. The specification also describes, in paragraph [0055], at a first stage the "property" is parsed into a root representing the logical implication operation, a left sub-property representing the variable, and a right sub-property representing $b \Rightarrow X(Xf)$. However, neither of these paragraphs describe how the "first property" has any kind of tangible or physical "logical structure".

35 U.S.C. 102 Rejections

19. Applicant asserts that Chiodo et al. does not teach: generating, from a first property, a first assumption including a first state predicate. Examiner disagrees with this assertion.

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20. Examiner points out that, in paragraph 2 of the Introduction, Chiodo teaches: generating (i.e. "deduce properties" same as generating a property or properties, pg 172, paragraph 2, Introduction), from a first property (i.e. properties, also see Introduction, paragraph 2 of pg 172), a first assumption (deducing by "reasoning", i.e. assumption is made based on reasoning of the individual components, see paragraph 2 of pg 172) including a first state predicate (state graph, i.e. state predicate, paragraph 2 of pg 172).

Conclusion

THIS ACTION IS MADE FINAL. Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire **THREE MONTHS** from the mailing date of this action. In the event a first reply is filed within **TWO MONTHS** of the mailing date of this final action and the advisory action is not mailed until after the end of the **THREE-MONTH** shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than **SIX MONTHS** from the mailing date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Suchin Parihar whose telephone number is 571-272-6210. The examiner can normally be reached on Mon-Fri, 8:30am-5:00pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Jack Chiang can be reached on 571-272-7483. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.


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